



U.S. Fish & Wildlife Service

Fairbanks

Fish & Wildlife Field Office

Yukon River Video Project

Fish wheels are commonly used as a capture method to determine relative abundance and run timing of Yukon River salmon. These "test wheel" catch rates are used by fishery managers to assess the in-season salmon runs on a daily basis. The wheels use live boxes to store fish until they are counted by dip netting. Recent studies on Yukon River fall chum salmon suggest that holding time and crowding in live boxes may affect the ability for fish to travel upstream to spawning streams. This is of particular concern during years of low salmon abundance.

A remote video system was developed to obtain salmon passage rates without the use of fish wheel live boxes, eliminating fish handling and crowding concerns. After fish wheel capture, fish travel down a chute, are video recorded, and then re-enter the river. The system consists of a color CCD camera mounted above the fish wheel chute and connected to a laptop computer through a video capture card. A time-lapse VCR is linked into the system for back-up. The system is powered by 12 volt batteries. During daytime operation, a water-wheel

generator charges the batteries. At night, lights necessitate the use of a small gasoline generator.

Video capture software allows the recording of only video frames containing fish images. These images are stored in computer video files. Video capture can be triggered using various methods i.e, magnetic switch door, motion sensor, and image recognition. Frame rate and number of frames captured before or after a triggering event are controlled by the software. The resulting files are reviewed and tallied using video reviewing software specifically designed for generating fisheries CPUE data. The time-savings using this method over traditional viewing

of time-lapse VCR tapes can be substantial.

Presently, two Yukon River fish wheels are equipped with this video system. Accurate daily counts of four salmon species, sheefish, whitefish, and various resident fish species are obtained using the video system. The benefits of video counting are a lowering of fish stress, 24-h sampling, reduced data recording errors, and lower operational costs. Other applications of this technology include monitoring fish passage at dams and weirs, identification of marked/unmarked fish in tagging studies, and remote monitoring of animal behavior.



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